Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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Weather supplies hazards – You apply controls

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

CONTENTS

POV FATALITIES through 30 June

FY01	FY00	3-yr Avg
69	81	88

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

A final note on change

Sometimes change is subtle, sometimes bold. The Army has seen a lot of it, with a lot more to come. It doesn't take a keen eye to spot the bold change in the look of *Flightfax*. I hope you'll tell us if you like it—and if you don't. More importantly, I hope you'll notice the more subtle changes in content and sections we've added, such as this one. The redesign is intended to provide you—aviators and commanders—with more relevant aviation hazards, risk, and controls information in a timely manner and provide you with insights on some of the 5-meter targets where your limited time and resources can impact most.

One thing has not changed. Accidents are still a major threat to soldiers. As we entered the fourth quarter of this fiscal year, our fatality rate was about 9 percent above where we were last year at the same time. While we are not achieving the overall 20 percent reduction in total military fatalities goal established for this fiscal year, command involvement is succeeding in reducing our privately owned vehicle (POV) accidents, notoriously the number one killer of soldiers. Currently, we are on target with nearly a 20 percent reduction in POV fatalities. There are still a lot of the 101 days of summer left, so we must keep the emphasis on POV accident prevention so that our success does not slip away. Of particular concern is the fact that fatalities from motorcycle accidents are on the rise. We must ensure that soldiers who choose to ride motorcycles receive the Motorcycle Safety Foundation Course at no cost to the individual soldier.

Aviation fatality rates are also up. Last year, aviation accidents and fatalities were at an unprecedented low. This year, we've lost some hard-earned ground in our aviation accident prevention efforts. Indiscipline—knowing the standard and electing to ignore it—is a factor in 25 percent of our aviation accidents. Weight and balance issues, weather decisions, and over water operations are critical areas of concern. Leaders should carefully assess these hazards and ensure informed decisions are made at the appropriate level. Of greatest concern are the effects of cumulative risk. Seemingly low-risk individual hazards, when left uncontrolled, can collectively raise risk to an unacceptable level.

A final note on change. As I write the first From the Director of Army Safety commentary for this inaugural color issue of Flightfax, I realize it is also my last. I'm passing the responsibilities of the Director of Army Safety to Brigadier General James E. Simmons. BG Simmons will now spearhead the Army's continuing efforts to affect a cultural change where risk management is not just another safety requirement but is fully integrated into all Army operations. I personally thank each of you for the great work you're doing in embracing risk management as a sound investment in readiness. An informed risk decision at the appropriate level is the standard we must meet. Soldiers' lives are at stake. ★

BG(P) Gene M. LaCoste.

Gene M LaCoste

(General LaCoste became the assistant Deputy Chief of Staff for Personel on 9 July 2001.)

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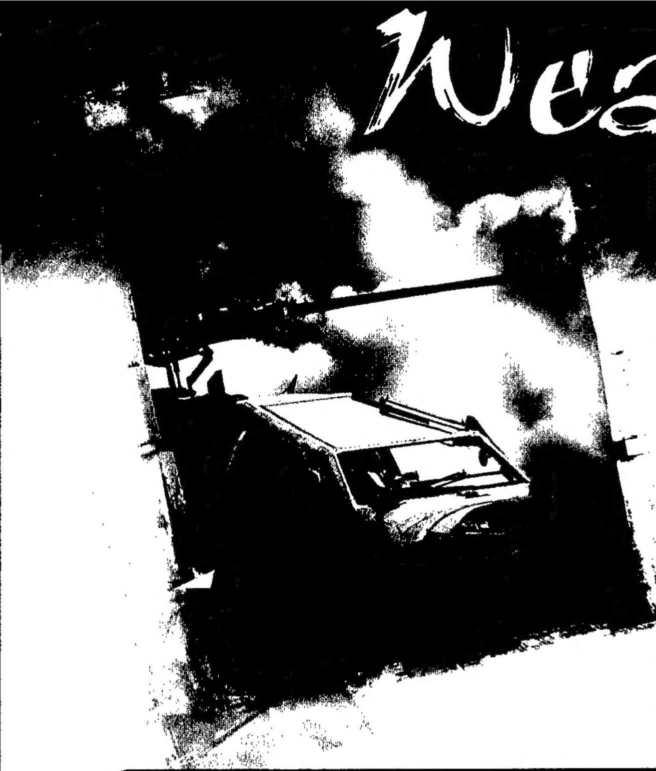


Weather can do strange things to your aircraft

And it's out of your control...or is it? Because the Safety Center has heard of several weather-related accidents recently, we thought it was time to look at different aspects of weather and your aircraft. In this special premiere color issue of Flightfax, we look at several weather-related subjects, and explore what you can do to manage the risk associated with some weather hazards.

The editor

Stages and Types

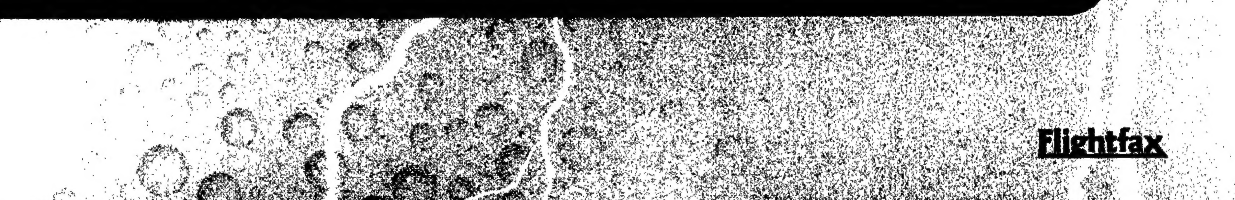
Pilots who fly IFR are very aware of the hazards associated with thunderstorms. They include squall lines, tornadoes, hail, ice, rain, low ceilings and visibility, lightning, and turbulence. But one issue that requires further discussion is the development of thunderstorms and the up and downdrafts and windshear associated with this development.

Thunderstorms develop in three stages and are basically of two types: air mass and steady state. They are different in that the life cycle of an air mass thunderstorm may last from 20 minutes to 1.5 hours while the life cycle of a steady state thunderstorm may last several hours.

Regardless of the type of thunderstorm, they all start as a cumulus cloud. During its life cycle, a thunderstorm cell progresses through three stages: (1) the cumulus, (2) the mature, and (3) the dissipating. In the cumulus stage, the updrafts vary in strength and extend from very near the surface to the cloud top. The cloud growth rate may exceed 3,000 feet per minute.

The most dangerous of the stages is the mature stage. The hazards associated with thunderstorms reach their maximum intensity in this stage. Downdrafts may exceed 2,500 feet per minute with updrafts exceeding 6,000 feet per minute. Updrafts and downdrafts close together create strong vertical shear and a very turbulent environment. Downdrafts characterize the dissipating stage of the thunderstorm.

—POC: Gary D. Braman, Fixed-Wing Aircraft System Safety Manager, U.S. Army Safety Center, *bramang@safetycenter.army.mil*, DSN 558-2676, CML 334-255-2676



Flying and thunderstorms—Do's & Don'ts

Do . . .

■ Avoid by at least 20 miles any severe thunderstorm, or one giving an intense radar echo.

■ Circumnavigate an entire area having 60 percent thunderstorm coverage.

■ Remember that vivid and frequent lightning indicates probability of severe thunderstorms.

■ Regard any thunderstorm with tops of 35,000 feet or higher as extremely hazardous.

■ Ensure that cells are a minimum of 40 nautical miles apart when you must fly between cells.

■ Circumnavigate cells upwind of the cell.

■ Know your airborne weather radar—its capabilities, limitations and in-flight trouble-shooting procedures. Carry the operator's manual with you when you fly.

■ Know that some approach control radars can only paint an area of weather and are not able to provide you thunderstorm Video Integrated Processor (VIP) levels as on your forecaster's weather radar. Ask the controller if he has ASR-9 radar. If so, the controller can give you the cell's VIP level.

■ Be aware that what you see on the forecaster's weather radar screen will not be the same on your airborne weather radar. Green on his screen will be yellow on yours. Yellow on his will be red on yours. Red on his may be magenta on yours; or it may be black, a shadow.

■ Update your weather after takeoff for any changes. When advised by ATC of weather advisories, check with approach control, pilot to metro service (PMSV) or flight service.

■ Know which VOR stations along your route of flight have HIWAS (Hazardous In-flight Weather Advisory) capability.

■ Remember that your airborne weather radar is meant for thunderstorm avoidance—NOT thunderstorm penetration.

Don't . . .

■ Don't land or takeoff in the face of an approaching thunderstorm. A sudden wind shift or low-level turbulence could cause loss of control.

■ Don't attempt to fly under a thunderstorm even if you can see through to the other side. Turbulence and wind shear could be disastrous.

■ Don't fly without airborne weather radar into a cloud mass with scattered embedded thunderstorms.

■ Don't trust visual appearance to be a reliable indicator of turbulence inside a thunderstorm.

■ Don't attempt to clear the top of a known or suspected severe thunderstorm. To do that safely, the top must be cleared by 1,000 feet for every ten knots of wind speed at the cloud top. This will exceed the capability of your aircraft.

■ Don't preflight plan a route of flight between echoes.

■ Don't ever fly into an area depicted as a shadow on your airborne weather radar.

Why were we there?

Our mission was to conduct an aerial gunnery to maintain currency as part of the continuous operations program. Our company had recently changed commanders, and everyone was unsure of the new boss and what his reaction would be to any type of failure.

It was mid-winter in Korea. The day got off to a slow start. Weather was questionable, at best, and no one really wanted to be there. When the weather was reported to be "legal" for the entire day, the commander continued to push the training. No one said anything, we just fell in line to accomplish the mission. The brief was an hour late, and the tension grew. It was hard not to notice the increasing agitation of the commander.

As the time approached for the run-up, the lead aircraft broke, decreasing the range time and pushing back the timeline even further. As we approached the range, the afternoon gave way to night and snow began to fall. The weather was getting worse and we had not finished our training for the day.

The forecast was for scattered snow showers throughout the night. Ceilings, temperatures and visibility were all decreasing, but still within the legal minima. We began to upload for the return flight home.

As we took off out of the valley, the snow began to intensify, and visibility decreased dramatically. We continued on our way, suffering from a severe case of *get-home-itis*. The flight seemed to slow to a hover at times, due to decreasing visibility and the lowering ceilings, causing visual illusions.

Options were decreasing rapidly for us. The lead aircraft disappeared into a cloud, and I lost him completely. The instinct born of every instrument meteorological conditions (IMC) briefing I had heard over the years told me I should be turning away from him and avoid going into that cloudbank.

I was flying in the left seat, chalk 2 of a staggered left formation. I turned to the left, expecting chalk 3 to turn to the right for the inadvertent IMC break-up, but were we inadvertent IMC yet? As I turned to avoid the cloudbank, a ridgeline came into view, growing in size like a morphing power ranger. I was increasing the bank angle to complete a 180 degree turn when the left side crew began screaming "Chalk 3, nine o'clock closing fast!" I scanned immediately to my left to see Chalk 3 closing through my upper green house window. Instead of turning away from me, he had tried to maintain the formation. When the turn was complete I had become Chalk 2 in a flight of two, with trail now leading. He had just passed over the top of my rotor system!

The only choice now was to take a deep breath, relax and continue to our home station. Everyone seemed to be waiting to breathe until we got back. After what seemed like an eternity, we disembarked onto solid ground.

During a lengthy and detailed debrief, we realized that several crewmembers felt the weather wasn't good enough for this flight. Some felt that they could not speak their mind, no matter how uneasy they felt about the mission. There seemed to be more concern about the timeline than standing back and looking at events. Everyone agreed that it would only have taken one person the stand up and ask "Why are we doing this under these conditions?" Never let it be said that you cannot be that one to ask *What are we doing here?*

—CW2 Dillon, ASOC-04

During a lengthy and detailed debrief, we realized that several crewmembers felt the weather wasn't good enough for this flight.

The Hurricane that cried Wolf

Although it was a beautiful day in North Carolina, we knew a hurricane was making its way towards the East coast. None of us at Fort Bragg expected what would happen next.

Soon after our morning physical training, the alert roster was activated instructing us to report to the flightline with a small overnight bag of civilian clothes. Upon arriving, we were briefed that a hurricane emergency operations center was activated and tracking Hurricane Bertha as it approached North Carolina. The plan was to evacuate all the flyable aircraft to Fort Knox as soon as possible.

It is a large operation to move two brigades worth of aircraft from Fort Bragg to Fort Knox. Fortunately, there is a plan for just this type of evacuation. Some of the items in the plan include flight routes, fuel stops with contract fuel, overnight arrangements at hotels en route and billeting arrangements at Fort Knox.

Even with the amount of pre-planning done at Corps level, the unit still had much to accomplish. For example, we needed to carefully check all the aircraft logbooks to make sure a service or inspection would not come due during the flight. The crew chiefs and maintenance sections performed the herculean task of getting every possible aircraft ready for evacuation, and they did a superior job. Aircrews made sure they had the proper sectionals for the cross-country flight and kneeboards were prepared with all the necessary frequencies for the flight. Air mission briefs were conducted for all the flights and the evacuation began.

Safe from the storm

All the aircraft made it to Fort Knox without incident. Hurricane Bertha changed course to the North and Fort Bragg and the Fayetteville area only received some rain and mild thunderstorms. At this point, most of us felt that we had burned up lots of flying hours on a cross-country flight that was unnecessary.

A few weeks later, we got word that Hurricane Fran was now headed for North Carolina. When we were alerted for possible evacuation, we all thought, "Here we go again." This time however, we were told to dense pack all the aircraft into the hangars. Aircraft were placed as close together as they would be on a C-5 Galaxy. A squadron of OH-58D aircraft that normally used an entire hangar were squeezed into a little over a quarter of the hangar. We put as many UH-60s as we could into the remaining space.

This one hit

Hurricane Fran did not turn north and spare us as Bertha had. It stormed through North Carolina leaving a path of destruction. Homes were destroyed and power went out across much of the area. I couldn't help but think of the millions of dollars worth of aircraft packed into hangars at the airfield.

Fortunately, when the storm cleared, there was only one hangar that had minor damage to the roof. None of the aircraft inside were damaged. While many of us thought (with 20-20 hindsight) that we should have evacuated the aircraft for Hurricane Fran and not for Bertha, the bottom line for both cases is that we did not lose any aircraft. In both cases the leadership evaluated the risk associated with the courses of action and made an informed decision at the appropriate level.

Take it seriously

The lesson learned from both of these scenarios is to take a hurricane warning seriously. You cannot predict exactly where a hurricane will go when it makes landfall, just as you cannot predict the order to evacuate or not. Know your unit's evacuation plan and prepare in advance for all contingencies.

—Major Dave Hudak, USASC, DSN 558-2075 (334) 255-2075, hudakd@safetycenter.army.mil

Tailplane Icing

Ice can accumulate extremely fast on the exposed surfaces of an aircraft. Some experts tell us that four to five minutes is all that is needed to build up ice on the surfaces of an aircraft and cause adverse flight characteristics.

In the last few years, I have heard of at least 16 airplane accidents resulting in 139 fatalities, attributed to ice contaminated tailplane stall (ICTS). This icing phenomenon causes a sudden downward force on the aircraft's elevator, which in turn causes a nose down attitude. Unchecked, it could quickly exceed 30 to 40 degrees. In one case, a pull force of 400 lbs was required to counteract this downward force.

The horizontal stabilizer (HS) and the attached elevator are sometimes referred to as the Tailplane. The elevator attached to the horizontal stabilizer of an aircraft controls the movement around the lateral axis (pitch) of the airplane. The pilot's ability to control his/her airplane about this axis is very important. In designing an airplane a great deal of effort is spent in making it stable around all three axis. But longitudinal stability, or stability about the pitch axis, is considered to be the most affected by variables introduced by the pilot, such as airplane loading. Three forces govern the pitch balance of the aircraft. The weight acts through the aircraft center of gravity (CG); the wing's upward lift acts through the wing center of lift and is aft of the CG. Note that these two forces generate a nose-down pitching moment. The horizontal tailplane creates a downward lift to counteract this nose-down pitch. The elevator allows the pilot to control the pitch.

NASA research

The FAA requested the NASA Glenn Research Center at Lewis Field, Cleveland, Ohio to study this ICTS phenomenon. Because the HS of most turboprop aircraft is engineered with a sharper leading edge than that of the main aircraft wing, the HS is a more efficient ice collector and collects a higher percentage of ice than the wings when flying in icing conditions. Therefore, if the crew observes ice on the other parts of the aircraft such as the wings, they should then presume there is a significant amount of ice buildup located on the unobserved HS leading edge.

Pop those boots

Currently, Army in-flight de-ice procedures for most aircraft installed with de-ice boots is to wait for the activation of the de-ice boots until a minimum 0.5 inch buildup of ice on the wing has accumulated. The reason for the 0.5 inch buildup is that anything less might not break off, but balloon out and then freeze to create a hollow air pocket between the ice and leading edge. This is referred to as 'ice bridging'. After formation of this pocket any subsequent activation of the de-ice boots would not have any effect on breaking up the ice. However with 0.5 inches of ice on the wing leading edge your HS could have twice that much ice buildup and you can't see it.

In the January 2001 *Flightfax* article by Thomas A. Horne, 'Avoiding Ice Fright' it was shown that 'ice bridging' is a myth. Mr. Horne points out that new research indicates, "...*that it's true more ice will shed if more ice is allowed to build on booted surfaces. But experts now say there is no reason to believe that ice can continue to form and bridge over leading edges and leave boots to helplessly pulsate behind an ever-growing sheath of ice*". With this in mind, aviators should pop their boots when any sizeable ice buildup is noticed on the boots. This would help prevent ice buildup on the 'out of sight, out of mind' horizontal stabilizer.

HS tailplane induced stalls are rarely a problem in cruise flight. Research indicates that during cruise flight in icing conditions, ice will collect on the HS, but result in very minor flight control changes. In this cruise flight profile, the HS is not anywhere near its performance limit. However, when the aircraft changes configuration for approach and extends flaps, the HS is pushed closer to its performance limits.

Flying in icing conditions can cause a buildup of ice along the leading edge of the HS creating a distorted leading edge and causing the airflow to separate under the HS and reattach itself further back on the airfoil than desired, causing a loss of lift. Along with an ice buildup on the HS aft of the de-ice rubber boots, this can cause the airflow to reattach itself aft of the hinge for the elevator. When this happens it causes a low-pressure area where the elevator will be forced down (again some tests show this force could be in excess of 400 lbs.), causing the nose of the aircraft to dramatically pitch down. Unfortunately, when this happens the corrective actions are almost exactly the opposite of what the pilot is trained to do during a wing stall condition. When the nose pitches down the yoke must be forced aft, the flaps must immediately be reset to the last position (landing flaps to approach flaps or approach flaps to flaps up) and power is either reduced or used very judiciously, but not maximum power. During a wing stall recovery the aviator is trained to push the nose forward, and add maximum power, further aggravating the Tailplane Stall.

Wing stall or tail stall?

Much confusion exists with the recovery procedures between a wing stall and a tail stall. Recovery procedures between the two are almost completely opposite.

To correctly diagnose which problem is present, situational awareness is critical. Wing stalls tend to occur at slower airspeeds and with flaps up. Tails stalls tend to occur during or shortly after flap extension, and at higher airspeeds.

If the situation progresses, a tail stall will always result in a nose-down pitch. With an ice-contaminated wing stall, the aircraft usually rolls initially, but could also pitch nose down.

The diagnosing of symptoms of tailplane icing are dependent on pilot experience, current workload in the cockpit and good crew resource management. This will determine the aircrew's ability to diagnose the suspected problem and proceed with the right course of action.

However, flying with the autopilot on in icing conditions can mask the aircraft hints telling the pilot that a problem is about to happen. The autopilot takes the pilot out of the loop of detecting flutters, lightness in the controls or lightness in the forward direction of the yoke, adverse movements in the yoke, pilot difficulty in trimming the aircraft, or pitch excursions similar to pilot induced oscillation. These are all telling signs of an impending loss of control on the horizontal stabilizer.

So remember, when in the terminal area and icing conditions exist, it is best to hand fly your aircraft, and pop the boots when you notice an appreciable ice accumulation on your wings.

—Bradford F. Kopp, USAREUR Fixed Wing Standardization Officer, V CORPS Aviation Safety and Standardization Detachment (CASSD), CH-47 SFTS Facility, Unit 29716, Box 354, APO AE 09028 DSN: 382-5389, Civil: 49-621-779-5389 ***g3cassdmhn@hq.c5.army.mil***

Investigator's Forum

Brownout conditions

The conditions that night were conditions an aviator can expect in any desert—low contrast terrain, and loose, blowing dust and sand. Any or all of these can eliminate any visual ground reference during certain maneuvers.

The mission for the UH-60L standardization instructor pilot (SIP) was to conduct night NVG (night vision goggle) training prior to the unit entering "the box" at the training center. The illumination for the scheduled period of training was zero. The winds had decreased significantly since the end of the day.

The plan for the evening was to conduct an NVG approach and takeoff simply to get a feel for the terrain and conditions. Next, pick up and fly a 500-gallon blivet over somewhat contrasting terrain. Finally, pick up and fly a TOW HMMWV in conditions to simulate those in "the box."

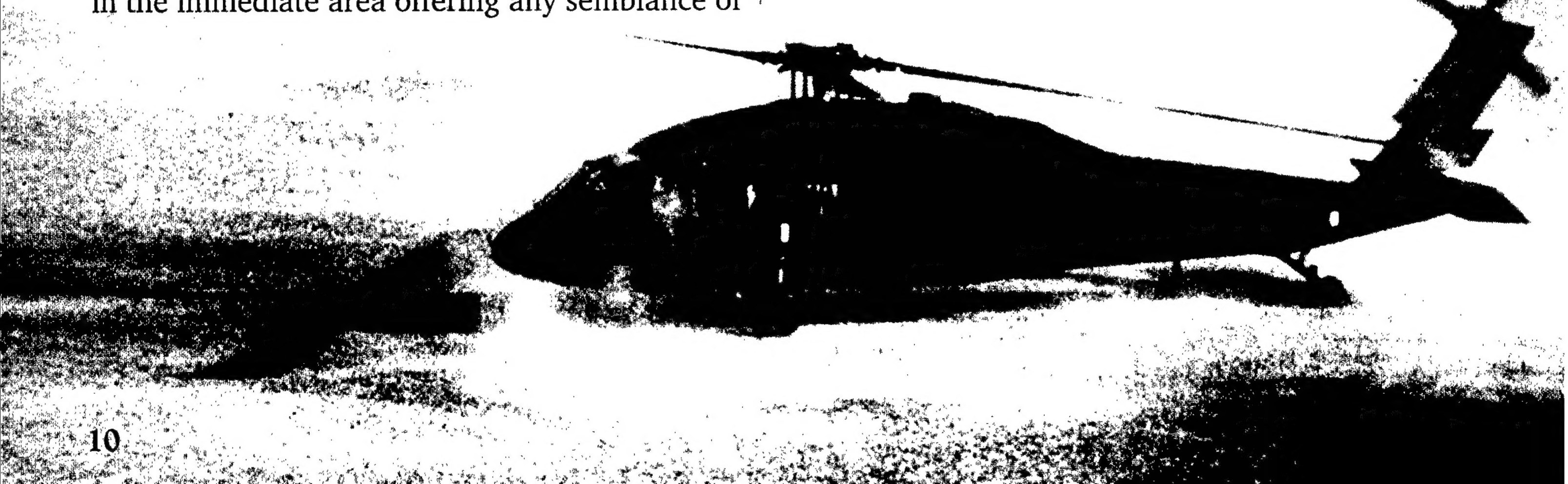
Neither the SIP nor the Instructor Pilot (PI) had attempted such a slingload under those conditions in recent memory. The SIP decided he would try it first. After three aborted attempts, the SIP successfully picked up the HMMWV on the fourth try, and turned the aircraft toward a dry lake bed, away from the originally intended flight path and also away from the only terrain in the immediate area offering any semblance of contrast or definition in the immediate area.

The SIP became focused on the pick up, and did not ask for, or receive, any crew coordination assistance from the rest of the crew. He was flying the aircraft and scanning the instruments when he became spatially disoriented in low illumination, low terrain contrast brownout conditions.

Because none of the other crewmembers had visual contact with the ground, there was virtually no crew dialogue. Overconfidence in his own ability led the SIP to not require the PI to make instrument callouts, namely power and radar altimeter readings. Approximately 500 feet from the pick up zone, the external load and then the aircraft impacted the ground and were destroyed. All five crewmembers sustained significant injuries.

Limited visibility operations, whether they're in dust, sand or snow, are some of the most challenging environments an Army aviator can face. The primary duty of the pilot in command is the safe operation of the aircraft while performing the mission. Flight technique is important while flying in these challenging conditions. However, crew coordination briefs, rehearsals, and application, coupled with the correct flight techniques, are critical to both mission accomplishment and aircrew safety.

—Major Erich Erker, Chief, Utility Branch, USASC, DSN 558-9853 (334) 255-9853, erkere@safetycenter.army.mil



Scratching your head for a proper fitting helmet?

The U.S. Army Aeromedical Research Laboratory (USAARL) offers a specialized fitting service for aircrew members who cannot achieve a comfortable, safe fit with their flight helmet. Over the years, we have assisted individuals experiencing persistent hot spots from unusual head characteristics including cranial ridges, protuberances, asymmetrical skull shapes, scars resulting from birth anomalies or burns or trauma, and even major facial reconstruction due to cancers. Just in the past 5 years, over 160 crewmembers have been seen in our Laboratory located at Fort Rucker, Alabama, and over twice that number have been accommodated through telephonic consult with unit ALSE personnel or flight surgeons.

The Laboratory's Problem Fit Team has many tools at its disposal to help achieve optimal fit, including contracting for special long or wide helmet shells, modifying suspension, retention, visor, or chinstrap assemblies, relocating earcup assemblies, and in some cases, custom molding earcups. In the past few years, custom thermo plastic liner (TPL)™ trimming has been performed most frequently. The Oregon Aero Zeta Liner™ is an evolving alternative to the TPL™ that is currently being tested. Over the past 5 years, USAARL has successfully modified the TPL for 66 individuals, and installed the Zeta Liner as an alternative for over 70 individuals. Our experience indicates the TPL accommodates better than the Zeta Liner for individuals with pronounced cranial ridges, individual protuberances (bumps), or scarring.

The Zeta liner appears superior on individuals who are pushing the limits (large/small or long/wide heads) in a given helmet shell size. Also, we have used the Zeta Liner in conjunction with experimental protective mask wear, and it may hold promise as a solution to those painful but necessary protective mask buckles. Although the comfort liner (e.g., TPL and Zeta Liner) is not designed to provide impact protection, USAARL engineers must verify that any new helmet component is safe. While that testing is being completed, the Zeta Liner is considered an experimental modification.

If you have a helmet fit or hot spot problem, first meet with your unit ALSE person and attempt to solve the problems locally, by using well-established procedures for helmet fitting. If you still have difficulty, see your unit flight surgeon, who can arrange for a USAARL consultation.

Aircrew and unit ALSE personnel should remember that USAARL is the only agency authorized to modify flight helmets beyond that which is designated in the appropriate manuals, as determined by helmet developers at the U.S. Army Natick Research Development and Engineering Center for the SPH-4 and 4B, and the Program Manager—Aircrew Integrated Systems, AMCOM for the HGU-56/P.

—Point of contact is Mr. Joseph R Licina, USAARL, Fort Rucker, AL, DSN 558-6893 or (334) 255-6893.

Aviation circuit breakers

The deliberately weak link in the electrical chain

Circuit breakers! They stare at you from panels at your knees, overhead, behind you, or perhaps on your console between you and your crewmembers. Occasionally they trip. Just what does it mean when they pop? Just what do these humble, yet hardworking, devices do? And, just as importantly, what don't they do?

Circuit breakers probably don't get the attention they deserve. However, neglect of critical components in aviation, even small ones like circuit breakers, can have tragic consequences.

What they do

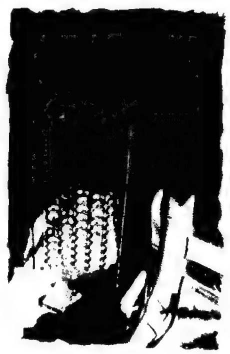
Aircraft circuit breakers are designed to interrupt the flow of electrical current when specific conditions of time and current are reached. Those conditions generate heat, and circuit breakers are designed to trip (open the circuit) before this heat damages the wiring or the connectors. If the designed overload conditions are not exceeded, the circuit breaker will not trip.

The very tolerances that must be built into a circuit breaker to prevent nuisance tripping mean that some glitches may not trip the breaker. Short, violent bursts of arc tracking will not necessarily trip breakers, which are comparatively slow-arcing devices. If your aircraft had aromatic polyamide wire, there are very good reasons not to be in a rush to reset any trapped circuit breakers—the results could be catastrophic.

Protecting the wiring, not the equipment

Circuit breakers are not intended to protect the electrical equipment, which may have its own built in protection system. They are intended to protect wiring and connectors. Aging, vibration, excessive bending, improper installation, heat, moisture, friction, windblast, and chemicals can damage the insulation on the wire and any connectors. This could also create a fire hazard, possibly in an area where it is impossible to use fire extinguishers, which can threaten the safety of a flight.

With any in-flight fire, an immediate landing becomes a very high priority. Because such an option may not always be readily available, adequate circuit protection and a good knowledge of what it can and cannot do is essential.



It's not a switch

On some aircraft, the circuit breakers are mounted along the bottom of the instrument panel. Having them within sight and reach can be a blessing and a curse; they can be seen and reset if necessary. But it is tempting to use them as a switch—a purpose for which they were never intended—and to reset them when they should not be reset. The construction of a circuit breaker was not designed for it to be used as a switch; that causes premature wear and the risk of failure.

When a circuit breaker fails, it will take down a system that may be needed for the safe operation of the aircraft, or it will leave a circuit online that should be de-energized. Both alternatives are unattractive, and both may inflict catastrophic consequences.

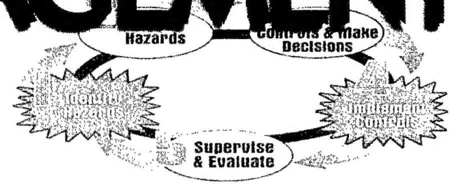
Think twice before resetting

When a circuit breaker trips in flight, it is telling you that something is wrong, and that there has been a serious electrical event. This danger signal should be treated with extreme seriousness. Some old hands might say they have heard it's okay to allow one reset. This is not prudent unless specifically called for in the operator's manual. Crews should not reset any tripped breaker unless it is essential to flight, and only after consulting the aircraft's Technical Manual.

Circuit breakers can be your friend, if you understand and respect their limitations.

—Adapted from the Aviation Safety Newsletter

TRAINING & RISK MANAGEMENT



Communication Is Key!

In previous articles, we discussed the first three steps of the risk management process: identifying hazards, assessing risk, and developing controls and making risk decisions. At this point, the controls have already been identified, selected, and used to re-assess the hazards to derive their residual risk. This article will address Step 4 of the risk management process—implementing the control(s).

Have you thought about how difficult it would be to tell a family member that a soldier in your unit died because an identified control simply was not implemented?

While leaders are good at identifying hazards, they often fail to implement controls needed to eliminate the hazards or decrease their risks. Once the commander or leader has selected controls, they must be effectively implemented or the entire risk management process breaks down.

Communication is key to implementation—— Ensure controls are communicated and understood down to the lowest level. This can be accomplished by integrating them into standing operating procedures (SOPs), written and verbal orders, demonstrations, rehearsals, battle drills, during mission or safety briefings, and back-briefs.

During orders production, the staff implements accident risk controls by coordinating across the staff and integrating them into the appropriate paragraphs and graphics of the operation order (OPORD). The controls selected, regardless of whether they already existed or are newly developed, should minimize the chance of accidents, and maximize the chance of mission accomplishment.

It is important to coordinate with adjacent units to ensure they understand the hazards identified and the controls to be implemented, especially if they will encounter the same hazards or play a role in implementing the controls.

Where the rubber meets the road— The most important aspect of implementing controls is clearly communicating how the controls will be put into effect, who will implement them, how they will fit into the overall operation, and how the commander expects them to be enforced.

Staff sergeants and sergeants are leaders/ first-line supervisors and as such, are key to implementing the controls specified in the operations order. For example, a control for convoy operations in adverse conditions is implemented that specifies maximum speeds and spacing between vehicles in the convoy. It is the squad or section leader's responsibility to make sure his soldiers are briefed on the controls, that they understand them, and they comply with them in order to minimize the risk of an accident. The Army has entrusted its leaders with the responsibility to effectively train soldiers on their battle tasks and make sure those tasks are performed to standard. Implementing controls and making sure they are performed to standard is no different.

By applying *all* of the risk management steps, we can reduce the risk that we face daily —during mission performance and at home. It is one thing to identify the controls; it is another to take action. Don't just think about it—communicate! Your life and your soldiers' lives may depend on it.

—POC: Dr. Brenda Miller, Ch, Training and Education Division, DSN 558-3553 (334-255-3553), millerb@safetycenter.army.mil

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class B

A Series

■ During flight, aircraft's main rotor system struck a tree, the crew landed the aircraft without further incident. Three main rotor blades were destroyed. The remaining blade sustained repairable damage.

Class E

A series

■ While hovering in ground effect (IGE), aircraft descended onto a rock causing damage to the VHF antenna. Crew found damage during post flight. Maintenance performed repair.

D series

■ While conducting day training flight, ECS DGR FWD advisory and ECS Fwd Fail caution were observed on the UFD. Crew aborted mission and landed the aircraft to the airfield without further damage. Maintenance inspection revealed that the No.1 ECS condenser failed due to No.1 ECS compressor low suction. The ECS No.1 was charged with R134A and the aircraft was released for flight.

CH-47

Class E

D series

■ During engine run-up, crew noticed a 5% fluctuation on the rotor RPM and a torque split of 20-30%. A maintenance officer was called out and an attempt was made to troubleshoot the No. 1 and No. 2 engine beep trim switch. During the first two tests, there was no response on the No. 1 and No. 2 engine beep trim increase. On the third attempt, the No. 1 engine began to high-side. Pilot pulled No. 1 engine condition lever to stop without damage. N2 actuator replaced.

■ Aircraft experienced a bird strike while flying as Chalk three in a formation of three aircraft. The bird struck the plexiglass windshield (chin-bubble) breaking it and creating a hole roughly the size of a grapefruit. The aircraft crew sustained no injury, and the aircraft was flown to base and landed without further incident. The chin bubble was replaced and aircraft was returned to service.

C-12

Class C

D series

■ Aircraft sustained a blown tire and prop damage while conducting a high speed braking MOC prior to a training mission. Accident is under investigation.

OH-58

Class A

C series

■ While maneuvering downwind to a tactical assembly area, aircraft encountered an uncontrolled spin and crashed. Crew exited the aircraft without assistance and sustained no injuries. A small post crash fire self-extinguished. Aircraft destroyed.

Class C

D-R series

■ During nap-of-the-earth, night vision goggle flight, aircraft's wire strike protection system (WSPS) contacted the ground. Subsequent inspection of aircraft revealed damage to the undercarriage and flight controls, as well as to the WSPS.

TH-67

Class E

A series

■ During hover, aircraft's air conditioner was inoperative. Aircraft landed without further incident. Maintenance replaced compressor.

UH-1

Class B

H series

■ During a Night Vision Goggle terrain flight takeoff, at approximately 100 feet above ground level (AGL), the aircraft experienced an engine under speed condition that did not respond in the emergency governor mode. During emergency autorotation, the aircraft encountered a brownout condition at approximately 20 feet AGL. The aircraft impacted the ground in a level attiude, collapsing the landing gear, coming to rest on its side.

Class E

V series

■ During IFR flight at 5,000 ft MSL, the engine chip light illuminated and stayed on steady. Crew diverted to nearest suitable airport which was about 35 miles away. Approach and landing was completed safely. Aircraft was shutdown with no incident when clear of runways. Further maintenance checks and ground runs confirmed metal in the oil so the engine was changed.

H series

While aircraft was on the ground with engine running, grinding was noticed in forward right and left cyclic quadrant. Aircraft was shut down without further incident. Replaced left and right servo cylinder and lower push/pull tube bell cranks. Maintenance test flown OK.

UH-60

Class C

A series

Aircraft struck wires during flight. Wire strike protection system channeled and negotiated the wires. Crew executed precautionary landing without further incident. Postflight inspection revealed damage to windshield, FAT gauges, pitot static tubes and all main rotor blade tip caps.

L series

Following takeoff, crew noticed unusual noise from the aircraft's rotor system. Aircraft was landed. Three rotor caps were identified as damaged. Tree strike suspected during previous landing to an unimproved site.

Class E

A series

During NOE flight no. 2 engine failed to low side then recovered briefly then failed to low side again with abnormal vibrations. Crew made a precautionary landing without further incident. Maintenance recovery team replaced the no. 2 engine alternator and recovered aircraft to home base without further incident. PQDR submitted.

NEWS & notes

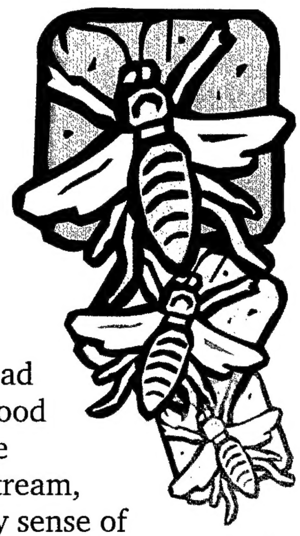
Airport data available for hand-held computers

The DESC AIR Card contractor, AVCARD, announced that they developed and have deployed a system that allows their on-line data base to be accessed by persons using Personal Digital Assistants (PDA). This means that pilots and aircrews can link their "Palm Pilots" to the AVCARD web site and download Fixed Base Operators (FBO) names, phone/FAX numbers, hours of operation, services provided, etc., at 6000 world-wide airports. This breakthrough allows aircrews to access into-plane and local purchase airport data when away from their internet-connected PCs. Access to this technology is at www.avcard.com.

Bee solution

Having problems with bees buzzing around your aircraft? The pesky creatures seem to have a special liking for Black Hawks. The rotor head apparently resembles an inviting tree crotch with lots of nooks and crannies around the gear box and unit joints that attract swarmers looking for a new hive. Here's one solution a unit used to ward off the critters.

One installation used 10 to 20 percent dishwashing soap in water to knock them down, because of the concern about unknown operational and corrosive effects of pesticides and solvents.



The crew chief can do this, since you don't need a certified bug guy to apply soapy water. With good aim, good head pressure, a good spread on the nozzle and stream, and a healthy sense of adventure, even killer bees are no problem. The wetting agent unhooks their hamuli so they can't fly, and shuts down their spiracles, which deprives them of respiratory oxygen. They are immobilized within seconds.

Tip: The green kinds of dishwashing liquid worked best. Some of pink and yellow varieties have flowery scents that attract more critters.

—LTC Terry Carpenter, USAF, Armed Forces Pest Management Board, Washington D.C, DSN 295-8317 (301) 295-8317, carpentl@acq.osd.mil

EXTRA! EXTRA! Read all about it

Writing your Flightfax article

Thinking about writing an article? Here are some helpful hints.

- Write about your own experiences, in your own words. Remember, ideally the story should sound like you are talking to a buddy.
- Future Flightfax topics will cover areas such as refueling, night vision goggles, spatial disorientation, simulators, FOD, flight data recorders... the list is as long as aviation problems can make it.
- A WORD document, e-mailed to **Flightfax@safetycenter.army.mil**, is the most efficient way for your story to get to us.
- Don't try to help us by putting it in column format. We just have to re-do it.
- Most *Flightfax* stories run about three double-spaced pages of text. If your story is longer or shorter than that, send it anyway. We can fix grammar and spelling. We'll try to keep it in your own unique "voice of experience."
- If you need help, e-mail or call the editor; if you have photos, send them, too. We are always looking for excellent photos. We need high resolution photos, preferably electronic, but a 35mm slide or a negative will do.
- Have fun with it.

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Even when it's "Clear, Blue & Twenty-Two"

An environmental accident can happen to you

Beware of Brownout